Scientific American.

THE ADVOCATE OF INDUSTRY AND JOURNAL OF SCIENTIFIC, MECHANICAL AND OTHER IMPROVEMENTS.

VOL. 2. NEW YORK, NOVEMBER 28, 1846. NO. 10.

THE NEW YORK
SCIENTIFIC AMERICAN:
PUBLISHED WEEKLY.
At 128 *Fulton Street, (Sun Building,)*
NEW YORK.
BY MUNN & COMPANY.
RUFUS PORTER, EDITOR.

TERMS.—$2 a year—$1 in advance, and the remainder in 6 months.

☞ *See Advertisement on last page.*

KNOWING FOLKS.

How wondrous wise some people are!
How vast their knowledge is!
They know the sun is not a star,
Nor the moon a piece of cheese.

They're very sure society
Consists of various sects,
And know that causes oftentimes
Are followed by effects.

They bore one with strange theories
Of sciences occult,
And know a process must be tried
To come to a result.

They tell you with a look profound—
Of course you must believe—
That often, in these wicked times,
Appearances deceive.

They think consistency should mark
The ways of those who teach;
And think—as who does not?—they should
Practice as well as preach.

They likewise have found out that he
Who quotes much holy writ,
And wears a face long as your arm,
May be a hypocrite.

They know—good Heav'ns what don't they know?
That honesty is rare;
That virtue is not *always* found
In maidens who are fair.

In every matter, great or small,
What wisdom they display;
They swear that if the wind is right,
'Twill be a rainy day.

And when a man in climbing falls
And breaks his neck—what then?
They know as sure as eggs are eggs,
He won't climb there again.

And when they hear a Yankee has
Been kill'd in Greece or Rome,
They doubt not he'd been living still,
If he had staid at home.

In short, they know quite every thing
That's sanctioned by the schools,
Except one little item—that
Themselves are knowing fools.

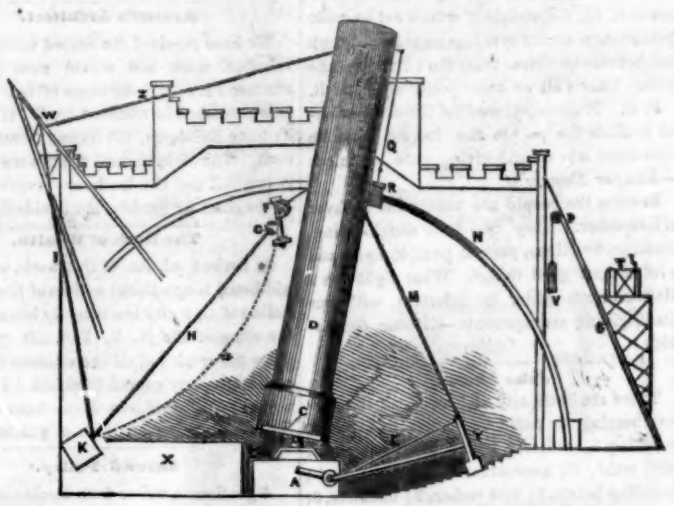
Grammatical Tautology.

I'll prove the word that I've made my theme,
Is that that may be doubled without blame;
And that that *that*, thus trebled, I may use,
And that that THAT that critics may abuse,
May be correct. Farther—the dons to bother—
Five THATS may closely follow one another!
For be it known that we may safely write
Or say, that that THAT that that man wrote was right:
Nay, e'en, that that THAT that THAT that followed;
And that that THAT (that that THAT that began)
Repeated seven times is right!—Deny't who can.

About Right.

In a recent Breach of Promise case in Connecticut, it was proved that the gentleman had visited the l dy every Sunday evening for two years. He was mulcted in the sum of $800—eight dollars a visit.

LORD ROSSE'S MAMMOTH TELESCOPE.



This Telescope is one of the principal artificial wonders of the world. It has been recently completed by the Earl of Rosse at an expense of nearly 60,000 dollars. The tube is 56 feet long. The speculum is six feet in diameter and weighs nearly four tons. Its composition is 126 parts of copper to 57 1-2 parts of tin; its focal length is 54 feet—the tube is of deal; its lower part, that in which the speculum is placed, is a cube of 8 feet; the circular part of the tube is, at its centre, 7 1-2 feet in diameter, and at its extremities, 6 1-2 feet. The telescope lies between two stone walls, about 71 feet from north to south, about 50 feet high, and about 23 feet asunder. These walls are as nearly as possible parallel with the meridian.

The engraving shows a view of the inside of the eastern wall with all the machinery seen in section. A is the mason work in the ground; B the universal joint which allows the tube to turn in all directions, C the speculum in its box; D the tube; E the eye-piece, F the moveable pully; G the fixed one; H the chain from the side of the tube; I the chain from the beam; K the counterpoise; L the lever; M the chain connecting it with the tube; Z the chain which passes from the tube to the windlass over a pulley on a truss beam which runs from W to the same situation on the opposite wall—the pully is not seen X; is a railroad on which the speculum is drawn either to or from its box—part is cut away to show the counterpoise. The dotted line, a, represents the course of the weight R as the tube rises or falls; it is a segement of a circle of which the chain I is the radius.

With a little attention to these several points the working of the machinery, we think will be easily comprehended. The weight on the lever L sinks only fifteen feet under the horizontal position, it then rests on the ground, and is, of course, no load on the tube, which is, when this happens, 30 degrees above the horizon. Now, it is easily seen how, when the tube is ascending and loosing its weight also lengthening the chain H, that on account of the chain I, whoselength is always constant, the counterpoise K is moving from the perpendicular position under G and, therefore loosing its power upon the tube, and approaching the perpendicular under W, and for this reason, transferring all its weight to the fixed chain I when the tube passes the perpendicular the chain H is again shortened and the counterpoise begins once more to draw it back so that the action of this tends to keep the tube always upright to whatever side it may point, and its power is always equal to the varying weight. Under these circumstances we see how easily and evenly the windlass can elevate the Telescope and turn it to the north, but when it arrives there it must be brought baek again and this is accomplished by the lever L. When the tube reaches within thirty degrees of the horizon the lever rests on the ground, and the tube is therefore able to descend by its own weight. When the tube points to the north the lever is elevated above the horizon and has not of course so much power as when it coincided with it, but it is in this case helped by the counterpoise K, which always tends to bring the tube to the perpendicular. This continues to help it until it becomes itself sufficiently able, from its hoizontal position, to do all the work: it then commences opposing it but it now has that help of the increasing weight of the tube deself and so all the parts are elegantly blended into one another with the most perfect concort and efficiency.

A perspective view of the building erected for the accommodation of the telescope with further remarks on the subject will be seen on ano ther page.

Plain Speaking.

A correspondent of the Baltimore American relates the following incident of the capitulation at Monterey:

"The bearer of the flag of truce proposed a surrender of the town, allowing them to remove all the public property; Gen. Taylor asked an unconditional surrender of every thing; quite a difference. They had from 8 to 12 o'clock to answer. At 12 they sent for General Taylor. After exhausting his patience with diplomacy, and Ampudia declared he was no ways straitened to submission, Gen. Taylor said, '*Sir, I hold your town, yourself and your army in the hollow of my hand, and you know it; the conference is closed. In thirty minutes you shall hear from my batteries.*' He took his hat to leave the room; Ampudia called him back and submitted.—This was told me in person by Gen. Taylor, and is strictly true of course."

A Yankee Cargo.

The packet ship St. Petersburgh lately sailed from Boston with 20,500 bushels Indian Corn, 300 hhds. tallow, 1,500 bbls. flour, 1200 do naval stores, 500 do apples, 400 do sperm oil, 300 do lard, 100 do grease, 39 do shoe pegs, 100 do onions, 60 cases clocks, 150 rocking chairs, 15,000 lbs. wool, besides sundry lots of Yankee notions, and 50 steerage passengers.

A gentleman has sent to the editor of the Petersburgh Intelligencer a potatoe weighing 9 1-2 pounds, and a turnip weighing 17 lbs.—He has a cow that gives 13 quarts at a milking. This is pretty well for Virginia.

A LIST OF PATENTS

Issued from the 7th of October to the 17th of October, 1846, inclusive.

To Stuart Perry, of New York City, for improvement in Gas Engines. Patented 7th Oct. 1846.

To John Goldenburgh, of Cincinnati, Ohio, for improvement in Fire Place Grates. Patented 7th October, 1846.

To James A. Cutting and George Butterfield, of Boston, Mass. for improvement in Couplings for railroad cars. Patented 7th Oct., 1846.

To William B. Treadwell, of Albany, N. Y. for improvement in Cooking Stoves. Patented 7th Oct., 1846.

To Jonathan W. Gordon, of Jamestown, N. C., for improvement in Corn Shellers. Patented 7th Oct. 1846.

To Rene L'Anglois, of Assumption, La., for improvement in Lightning Conductors. Patented 7th Oct. 1846.

To Samuel C. Wilt, of Hartleton, Penn., for for improvement in Lanterns for destroying Insects. Patented 7th Oct., 1846.

To Isaac Slack, of Avondale, Penn., for improvement in Carriage Axles. Patented 10th Oct. 1846.

To Henry W. Sabin, of Rushville, N. Y., for improvement in Windlasses. Patented 10th Oct. 1846.

To Charles H. Rogers and Samuel H. Hancox, of Troy, N. Y. for improvement in Stoves. Patented 10th Oct. 1846.

To Rose Winans, of Baltimore, Md., for improvement in Locomotive Engines. Patented 10th Oct. 1846.

To J. W. Howlett, and F. M. Walker, of Greenboro, N. C., for improvement in Preparing Grain for Flouring. Patented 14th Oct.

To Benjamin Babbitt, of New York City, for improvement in Machinery for Trimming Brushes. Patented 14th Oct. 1846.

To Clinton Foster and Levi Jones, of Laporte, Ia., for improvement in Threshing Machines. Patented 17th Oct., 1846.

To Timothy Demark Jackson and Alfred Judson, of Rochester, N. Y., for improvement in Bell Machinery for Hotels, &c. (said Alfred Judson having assigned his right, title and interest in said improvement to T. D. Jackson.) Patented 17th Oct. 1846.

To Peter Von Schmidt, of Washington, D. C., for improvement in Cotton Gins. Patented 17th Oct. 1846.

To Nicholas I. Lampman, of Coxsackie, N. Y., for improvement in Hay and Cotton Presses. Patented 17th Oct. 1846.

RE-ISSUES.

To Erastus B. Bigelow, of Boston, Mass., for improvement in the Power Loom for weaving Coach Lace and other similar fabrics. Original Letters Patent dated 20th April, 1837.—Re-issued 25th Sept. 1846.

To Clement O. Read, of Milford, Mass., for improved Machine for manufacturing Wood Screws. Original Letters Patent dated 15th December, 1837.

DESIGNS.

To Samuel W. Gibbs, of Albany, N. Y., for Design for Stoves. (Assigned to Augustus Quackenboss, of Albany.) Patented 3d October, 1846.

To John S. and Merritt Peckham, of Utica, N. Y., for Designs for Stoves. Patented 3d October, 1846.

To Robert A. Gregory, of New York City, for Design for Stoves. Patented 3d Oct. 1846.

To Ezra Ripley, of Troy, N. Y., for Design for Stove. (Assigned to Johnson & Cox.)—Patented 3d Oct., 1846.

To Cresson, Stewart, Beesely & Sailor, of Philadelphia, Pa., for Design for Stove. (Assigned to W. P. Cresson.) Patented 3d Oct., 1846.

To W. & R. P. Resor, of Cincinnati, Ohio for Design for Vases. Patented 10th Oct. 1846

I LOVE TO LIVE.

"I love to live," said a prattling boy,
As he gaily played with his new bought toy,
And a merry laugh went echoing forth,
From a bosom filled with joyous mirth.

"I love to live," said a stripling bold—
"I will seek for fame—I will toil for gold."
And he formed in his pleasures many a plan
To be carried out when he grew a man.

"I love to live," said a lover true,
"Oh, gentle maid I would live for you;
I have labored hard in the search of fame—
I have found it but an empty name."

"I love to live," said a happy sire,
As his children neared the wintry fire;
For his heart was cheered to see their joy,
And he almost wished himself a boy.

"I love to live," said an aged man,
Whose hour of life was well nigh ran—
Think you such words from him were wild?
The old man was again a child.

And ever thus in this fallen world;
Is the banner of hope to the breeze unfurled;
And only with hope of life on high,
Can a mortal ever love to die.

I LIVE TO LOVE.

"I live to love," said a laughing girl,
As she playfully tossed each flaxen curl;
And she climbed on her loving father's knee,
And snatched a kiss in her childish glee.

"I live to love," said a maiden fair,
As she twined a wreath for her sister's hair;
They were bound by the cords of love together,
And death alone could these sisters sever.

"I live to love," said a young gay bride,
Her loved one standing by her side,
Her life told again what her lips had spoken,
And never was the link of affection broken.

"I live to love," said a mother kind—
"I would live a guide to the infant mind,"
Her precepts and example given,
Guided her children home to Heaven.

"I shall live to love," said a fading form,
And her eye was bright and her cheek was warm,
As she thought of the blessed world on high
She would live to love and never die.

And ever thus in this lower world,
Should the Banner of Love be wide unfurled
And when we meet in the world above,
May we love to live, and live to love.

Hood's Description of November.

No sun—no moon!
No morn—no noon—
No dawn—no dusk—no proper time of day—
No sky—nor earthly view—
No distance looking blue—
No road—no street—no 'tother side the way—
No end to any row—
No indications where the crescents go—
No top to any steeple—
No recognitions of familiar people—
No courtesies for showing 'em—
No knowing 'em—
No travelling at all—no locomotion—
No inkling of the way—no motion—
"No go," by land or ocean—
No mail—no post—
No news from any foreign coast—
No park—no ring—no afternoon gentility—
No company—no nobility—
No warmth, no cheerfulness, no healthful ease
No comfortable feel in any member—
No shade—no shine—no butterflies—no bees—
No fruits, no flowers, no leaves, no birds,
November!

The quantity of land owned by the United States, exclusive of unsold Texas and Oregon lands, is two hundred and forty-two millions of acres.

Thanksgiving.

Editors must be cautious in their remarks about the appointment of thanksgiving in different states. It will be seen that the Boston Post has nearly got its ears pulled by such medling.

THANKSGIVING.—Thursday, the 3d. of December, has been appointed as a day of Thanksgiving in Maine. Why couldn't tha Governor have said November 26?—*Boston Post.*

Because the turkeys would want an extra streak of fat, the sleighing would not be quite good enough nor the evenings quite long enough and because he choose to say the 3d and not the 26th. This is all we know positively about it.

P. S. It is conjectured the Governor wished to allow the people the longest possible time to get into a thanksgiving state of mind. —*Bangor Democrat.*

Because the people are unanimous in favor of December. They can have sleigh-riding, courting, weddings, parties, pumpkin pies and a lot of other good things. What right has a Massachusetts editor to interfere with our thanksgiving arrangements.—*Maine Cultivator.*

John Smith.

There are in the city of New-York 101 persons bearing the name that heads this article, pursuing 55 different trades and professions, viz; artist, 1; accountant, 1; blacksmith, 1; boarding house, 1; boot maker, 2; butchers, 3; carmen 10; confectioners, 2; cotton sampler, 1; chair makers, 2; carpenters, 8; clerks, 4; commission merchant, 1; carrier, 1; dry-goods, 1; doctors, 2; engraver, 1; gardener, 1; grocers, 3; harness maker 1; homeopathic doctor, 1; iron founder, 1; jappaner, 1; junk store, 1; lawyer, 1; laborers, 5; looking glasses, 1; merchants, 2; machinist, 1; musician, 1; ministers, 2; oil factory, 1; porters, 3; policeman, 1; pedlar, 1; porter house, 1; printers, 3; pottery, 1; painters, 2; provisions, 1; stone cutters, 3; shoe makers, 3; sailors, 6; speculator, 1; silver plater, 1; saw filer, 1; ship carpenter, 1; ship joiner, 1; ship master, 1; tobacconist, 1; tailor, 1; umbrella manufacturers, 2; weaver, 1; watch dealer, 1.

Use of the Telegraph.

A telegraph dispatch was received at Philadelphia on Thursday of last week, from a gentleman in Providence, authorising a lawyer to institute proceedings to recover money from the captain or consignee of a vessel then about to sail for Europe. In twenty minutes from the time of the dispatch leaving Providence, the vessel was placed in custody.

The Albany Argus observes that the result of the election in Buffalo was known in Albany before the vote of a single ward in that city had been counted; and before the votes of the whole city had been canvassed the results had been received from Rochester, Auborn, Syracuse, Rome, Utica, Troy, and the city of New-York.

Large Receipts of Cotton.

The Columbia, S. C., Chronicle of the 4th instant says forty-five hundred bales of cotton were received and weighed by the public weighers last week in that town, and that five hundred bales more were also received and weighed by purchasers,—making altogether about five thousand bales for the week.

A Stretcher.

Jonathan Russel of Philadelphia hassucceeded in making a strecher which will stretch any or all parts of the boot or shoe by simply turning a screw. The screw, acting upon a lever in the boot tree, will stretch the instep, heel, or leg of a boot as may be desired.

A Second Summer.

Reports from various sections of the country represent that the recent warm rains and weather have produced strawberries and various other kinds of summer fiuits of the second growth. In many places the trees are putting forth new leaves.

A Travelling Puss.

An English paper mentions an instance of recent occurrence, in which a cat that had been put into a sack and carried from Innerleither to Edinburg, a distance of thirty miles, over mountains and fields, succeeded after a few weeks in finding her way back to her former residence.

Cooling.

A lady in this city has discovered a sovereign remedy for squalling babies. Whenever one of hers takes the tantrums and becomes ungovernably obstreperous she strips it stark naked and plunges it head over heels into a tub of cold water. Besides being very conducive to its health it has the effect of stopping its squalling instanter. Its wrath cools quickly and it goes off into a regular snooze directly. Serve it right.—*Dayton Tran.*

Ranlett's Architect.

We have received the secood number of this valuable work and would most cheerfully commend it to the patronage of the public.—It is published in numbers by W. H. Graham Tribune Buildings, 160 Nassau street, at 50cts each. The architectural designs are apparently original and the landscape representations of the plans for gardens are decidedly so.

The Book of Wealth.

A revised edition of this work, with many additional biographical notices of the first capitalists of this city has recently been issued at the office of the N. Y. Sun. It purports to show the wealth of all the citizens of this city whose property exceed $100,000. In this catalogue the name of John Jacob Astor still leads, his wealth being put down at $25,000,000.

Shrewd Policy.

A gentleman writes from Rochester that the Railroad Company being restricted from carrying flour while the navigation of the canal continues, have made arrangements for storing flour free of charge until the canal closes, and then transport it at a cheaper rate than it is done by the canal.

Kennebec Dam.

The work of preparing the dam and basin for the conveyance of water to the factory, is nearly finished. The water was let into the basin on Monday, and but little more is to be done to give it a safe and permanent passage from the river to the factory.

Thanksgiving.

In at least thirteen States Thanksgiving this year was observed on the 26th of November, viz:—New-Hampshire, Vermont, Rhode-Island, Pennsylvania, Ohio, Michigan, Indiana, Massachusetts, Connecticut, New-York, Maryland, Kentucky, and New-Jersey.

Success of American Arms.

During the late disastrous gale at Key West, one of the vessels, having lost all her anchors, rode out the storm in safety with the bower end of a cable attached to one of the *carriage wheels intended for General Taylor's army.*

Shortening Distance.

It is said that the proposed Stony Brook Railroad, will make the distance from New-York or Albany to Lowell, shorter than from those cities to Boston. Quite an accommodation to Lowell.

To soften hard, old Putty.

Put soap on the putty for a short time.—Panes of glass may easily be removed, by the application of soft soap for a few hours, however hard the putty has become.

Bears.

Thousands of Bears are said to infest North Mississippi, and are making their way from the Mississippi bottoms to the hills in search of food. The sportsmen of Hernando and Panalo are out in full strength after them.

Lightning.

A severe thunder-storm occurred at New Lisbon, Ohio, on the 3d instant, and in one instance a threshing machine was struck while in operation in a barn.

The Difference.

In 1776, an important dispatch was carried from Philadelphia to Boston in 50 hours, which was considered an extraordinary dispatch—now it can be conveyed in the same number of seconds!

Wholesale Desertion.

There were about 1500 desertions from the U. S. service at New Orleans in one night not long since. The deserters were mules.

Sending Gold to Mexico.

Captain Murphy was at St. Louis a few days since, with $120,000 in gold which he was about to forward to Santa Fe.

TO CORRESPONDENTS.

"A. H. S. of Florence."—We have no knowedge of the machine of which you most particularly enquire. With regard to the water-ram we have frequently seen it in operation and have no doubt of its utility in some few favorable locations, although we can perceive no peculiar advantage which it possesses over other plans and arrangements of machinery for the same purpose. We cannot give you a description of the machine without an engraving and we cannot think the machine sufficiently interesting to authorise the expense.

"Whaleman," of N. Bedford is dissappointed because we did not carry out phonography to the full extent of the system, but he is not aware—nor were we until we tried it—of the difficulty attending its publication. In fact we found it next to impossible to procure the requisite engravings, and those which we did procure cost us four times as much as other engravings of the same apparent magnitude.—There appeared to be no end to the combinations and we judged it would have cost us $100 to have completed the system, and as but very few, comparatively, manifested much interest in it we were induced to allow our readers to content themselves with the first principles.

Without any apologies for delay, we would say to T. O. H. of N. B., E. D. of S. R., J. S. of R. I., H. of L., R. S. L. of Y. S. and L. A. of A., that their respective communications will be attended to without further delay.

Demand for Cotton.

It is stated by an American now in Frankfort that one of the German principalities has given an order for 300,000 bales of cotton to be manufactured into *gun cotton*, for military purposes.

Evacuation day brought with it to this city a heavy and bitter cold rain, which, however, did not dampen the military ardor of our citizen soldiery, who passed the day with all the customary festivities.

There are now over *ninety* packet ships which trade between New-York and Europe, 53 to Liverpool, 18 to Havre, eight to Glasgow, 5 to Marseilles, and 2 to Belfast.

Mount Mitchell, in North Carolina, is the highest land in North America, east of the Rocky Mountains, being 6,276 feet above the level of the sea.

A tremendous explosion of a steam boiler occurred at Pittsburgh on Friday, killing two men and destroying the building in which it was located.

A new steamer named the "Alexander Scott," is attracting great attention at Louisville, Ky. It is said she will vie with all the floating palaces on the Western waters.

There are eight silk establishments in Massachusetts, which produced, during the last year, 22,500 lbs. of sewing silk, valued at $150,477.

Commodore Sloat, the bold and successful conqueror of California, is now enjoying himself at his peaceful residence on Staten Island.

It is stated in the Matamoros Flag, that a large portion of the Mexican population, are mere serfs, or virtually *slaves* to landholders.

Somebody says he saw a fence made of such crooked rails that every time a pig crawled through it he came out on the same side.

The revenue of Great Britain is £52,000,000 annually, and £62,000,000 are annually spent for intoxicating drinks.

A massive silver pitcher, to cost $200, is manufacturing in Philadelphia, for General Taylor.

American ice has been sold in England during the past season for four cents a pound; or $2,50 per cwt.

The share of the British Income tax which is drawn from the Bank of England, is £30,000 per annum.

A mass of gold weighing four pounds, was lately found in Monroe county, on the land of a Mr. Shields.

Twenty thousand Russians have fallen in battle during the last campaign against the Circassians.

CHEMISTRY.

Continued from No. 9.

The nature of light, like that of heat, is still nnknown to us. There are two theories respecting it: the first is, that light is a substance emanating from the sun and from all luminous bodies, from which it is projected in right lines with great velocity; the second is, that the sensation of light is produced by the vibration of a subtile fluid filling space—and is hence called the undulatory theory. Luminous bodies, according to this view of things, are merely stimuli, which excite these vibrations. An examination of these theories, however, cannot be here entered into. The connection between light and heat is so obvious, that it is scarcely possible to examine the one independently of the other. If a mass of iron be put into a fire for some time, no change is produced except the expansion of the metal and the elevation of its temperature. Gradually, however, as the heat is communicated a remarkable occurrence will be observed.—The iron becomes ignited, or red hot; in other words, it emits light, and renders objects visible. The original sources of light, are, first, the celestial bodies, as the sun and stars; and secondly, terrestrial bodies, as a common fire or candle. Light passes freely through the atmosphere, and, striking upon objects, is reflected or thrown back by them; and thus they become visible. By means of a wedge of glass called a prism, light can be separated into seven colors, which are violet, indigo, blue, green, yellow, orange and red. But it is only with the chemical agency of light that we have to do. Its influence in this way is conspicuous in a variety of natural and artificial processes. In vegetation it is indispensable, as without it, plants do not acquire their due elementary constitution. They are weakly, inodorous, and fail to exhibit their natural color.

Vegetables which grow in the dark have a blanched appearance. The power of light to dispel vegetable colors is manifest in bleaching where a dingy web becomes pure and white by exposure to the sun's rays. Its energy is still more decisively seen in the influence which it exerts in promoting chemical combination and decomposition, and the latter effect has been made use of as a measure of its power. Light enters into a kind of transitory union with certain substances, rendering them visible in the dark. Bodies which possess this property are called phosphorescent; such as the shells of fish, the bones of land animals, marble, limestone, and the like. The glow worm is a remarkable instance of phosphorescence in living animals.

A remarkable recent invention, the Daguerreotype, is wholly dependent for success on the action of light. It consists in having a thin plate of silver, prepared with iodine, so placed that the rays of light reflected from an object to be sketched, will fall upon it. This is done by putting the plate in a camera-lucida, and the action of the light upon the iodine and silver, is such, that when the plate is subjected to the vapor of mercury a complete representation of the object is given. A beautiful illustration of the action of light may also be seen in photogenic drawing. Paper for this purpose is prepared by steeping it in a weak solution of nitrate of silver or bichromate of potass. The paper must be kept from the light during the preparation; and if it is now exposed to the sun's rays with a leaf or other object upon it, a complete representation of the object will be obtained. The part exposed to the sun becomes darkened, while that covered by the leaf remains of a light color.

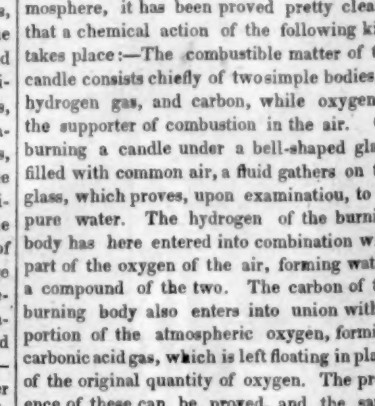
COMBUSTION.

Combustion is a process not yet perfectly understood. It is usually described as the union of a *combustible body* with a *supporter of combustion*, attended with the revolution of *light* and *heat*. The combustible body is that which *burns*, but, in general, will neither support combustion, nor burn except in presence of a supporter of combustion. The supporter, again, does not itself burn, though necessary to the burning of a combustible. Oxygen gas, the ingredient which enables the air to support combustion, possesses, when pure, a high degree of the supporting qualty. If a lighted taper, a combustible body, be plunged into this gas, the taper burns vividly, but the gas itself is not ignited. If, on the other hand, the taper be plunged into a combustible gas, such as pure coal gas, the gas is instantly ignited, but the taper is extinguished. These are general rules, relating to supporters of combustion and combustible bodies. By examining the effects of combustion, in the case of a candle burning in the air of the atmosphere, it has been proved pretty clearly that a chemical action of the following kind takes place:—The combustible matter of the candle consists chiefly of two simple bodies,—hydrogen gas, and carbon, while oxygen is the supporter of combustion in the air. On burning a candle under a bell-shaped glass, filled with common air, a fluid gathers on the glass, which proves, upon examinatiou, to be pure water. The hydrogen of the burning body has here entered into combination with part of the oxygen of the air, forming water, a compound of the two. The carbon of the burning body also enters into union with a portion of the atmospheric oxygen, forming carbonic acid gas, which is left floating in place of the original quantity of oxygen. The presence of these can be proved, and the same process takes place in the case of coal, wood, &c. Thus it is seen that combustion only changes the forms of the burned bodies, and does not annihilate them. Plants, moreover, will soon extract the carbon again from carbonic acid, and the hydrogen from the water leaving the oxygen in the atmosphere to support combustion, and fulfil its other uses; while the other principles render wood combustible anew. This round of changes, goes on unceasingly, without any ingredient being destroyed.

The phenomena of combustion are thus so far explicable, but unfortunately the source of the *light* and *heat* yet remains a mystery.—It is unknown whether the chemical action is the cause of the light and heat being evolved, or the evolution of these the cause of the chemical action. Where all is doubt, it would be in vain to dwell on this point. The laws stated respecting combustible bodies, and supporters of combustion, only apply generally, it is also to be observed, and under ordinary circumstances. Under the oxy-hydrogen blowpipe, the most incombustible bodies can be made combustible; and combustion can be shown to take place under an exhausted receiver, without the presence of any supporter, at least of a gaseous kind. We must wait patiently for a solution of these difficulties, until the genius of man has discovered more delicate instruments of philosophical investigation than any with which we are as yet acquainted.

(*To be continued.*)

Hopper Bevils.



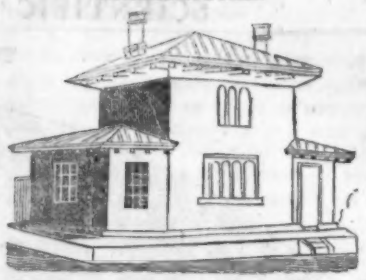
PINE CREEK, Nov. 18, 1846.

Messrs. Munn & Co.

Those who have made such a thing as a Millhopper know that the only difficulty is in getting the bevil for the corners. By the following method any one can cut the bevil for a hopper of any shape. Let A B C be a side or rather edge view of any hopper, A and B being two opposite corners. If we know what dimensions we wish the sides to be, it is easy by a simple rule in the square root, to find the distance A B. Then draw the figure A B C, and produce C E through the centre of A. B to meet a semi-circle described upon A B in D. Join D B. The angle E B C or E A C will be the bevil to cut the top of the hopper sides, upon which then lay the angle E B D or E D B, to cut the bevil of the corners. This will work in any shaped hopper you wish to make. The angle E B D is always 45 degrees.

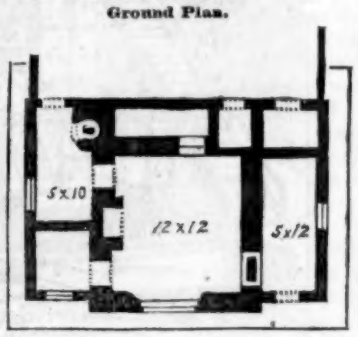
Yours respectfully, T. P. S.

ARCHITECTURE.



We here present one of the smallest and cheapest kinds of fancy cottages, and one that, with the exception of a deficiency of light to the principal rooms, may be considered judicious and convenient. The snug little parlor appears well calculated for winter, the comparatively spacious hall and narrow kitchen corresponding, as shown in the

Ground Plan.



This design appears better adapted to the taste of the middle States, than that of New England, though it is evidently designed for a northern climate.

HUMOROUS.

SHORT STORIES.

The following quaint but instructive items of history, are not very new; but as they contain instructive illustrations, and as such are useful for reference, we shall be excused for giving them an insertion.

Going to Law.

Two Dutchmem, who built and used in common a small bridge over a little stream which ran through their farms, had a dispute concerning certain repairs, which it required after a time, one of them declining to bear any portion of the expense necessary to the purchase of two or three new planks. Finally, the aggrieved party went to a neighboring lawyer, and placing ten dollars in his hands, said, "I will give you all dish moneys, if you'll make Hans do justice mit the bridge."

"How much will it cost to repair the bridge?" asked the honest counsellor of the determined litigant.

"Well, den, not more as five tollar," replied the Dutchman.

"Very well," said the lawyer, pocketing one of his notes, and handing him the other, "take this, and go and get the bridge repaired; it's the best course you can take."

",Yaas," said the Dutchman, slowly, "dat ish more better dan to quarrel mit Hans" but as he went along home, he shook his head frequently, as if unable after all quite clearly to see how he had gained anything by going to law.

Flourishing a Handkerchief.

In some parts of Europe it is not unusual to bring about matrimonial engagements by means of advertisements. Some years ago it was agreed in a gay party of ladies and gentlemen, in London, that an advertisement should be inserted in a morming paper, as from a young lady, rich and beautiful, who felt inclined to the state of matrimony. In the course of the day letters were received from between fifty and sixty swains of all descriptions, in reply to each of whom an answer was addressed, stating that the lady wished, previous to his being introduced to her, to see him, at the same time requesting each to be in the pit of the Drury Lane theatre on the following evening dressed in a blue coat, white pantaloons. and scarlet vest, and immediately on the conclusion of the first act to stand upon the benches, flourish a white handkerchief in one hand, and apply a glass to the right eye with the other. Every thing succeeded so well that as soon as the curtain fell, about fifty individuals, of all ages, forthwith mounted the benckes, from the smooth chinned Adonis of 18, to the sleek, portly, self-confident widower of 50, and the emaciated bachelor of 60, dressed in uniform, according to orders, in the gayest style, and with the utmost nicety, to make deeper the impression on the heart of the fair prize. High swelled their bosoms with hope, as, with studied action, the handkerchief was flourished and the glass raised to the eye. But who shall paint the astonishment, dismay, and rage which were depicted in every countenance as they gazed upon each other and discovered the sudden failure of all their hopes? With almost incredible velocity they descended from their unenviable attitudes to "hide their diminished heads" among the crowd.

New Plan of Courtship.

At a wedding, recently celebrated, were some twenty-five young persons, all of them in a condition which, for various reasons they generally concurred in regarding as undesirable, viz., *the unengaged*. One of the gentlemen of the party suspected the prevalence among them of feelings, that might easily be exchanged for others infinitely more fixed and agreeable. He accordingly proposed the selection of a President, a person worthy of all confidence, whose duty it should be to receive from each individual a folded paper inscribed with the name of the person handing it in, and also with the name of another person, of the other sex, whom the first would be willing to marry. The President, in addition to the restraints of his own sense and honor, was to be put under a solemn pledge of eternal secresy. All refusing to accede to the proposition were for the time to leave the room.—Those whose choice was reciprocal, that is, whose papers contained *the same two names* were to be privately informed; while the selections of the others were to remain undisclosed. The result was that the trial was made—all shared in the experiment,—and eleven couple were found to have made themselves happy, and their several unions were subsequently consumated.

A man of few words.

A young mam some time since arrived at an inn, and after alighting from his horse, went into the traveller's room, where he walked backwards and forwards for some time, displaying the utmost self-importance. At length he rang the bell, and upon the waiter's appearance, gave him an order nearly as follows:—"Waiter;" "Sir."

"I am a man of few words, and don't like to be continually ringing the bell, and disturbing the house; I'll thank you to pay attention what I say."

"Yes Sir," replied the waiter.

"In the first place, bring me a glass of brandy and water, cold with a little sugar, and also a tea-spoon; wipe down this table, and throw some coals on the fire; bring me a couple of candles, pen, ink, and paper; some wafers, a little sealing wax, and let me know what time the post goes out; tell the hostler to take care of my horse, dress him well, stop his feet, and let me know when he's ready to feed; order the chambermaid to prepare me a good bed, take care that the sheets are well aired, and put a clean nightcap and a glass of water in the room; send the boots with a pair of slippers that I can walk to the stable in; tell him I must have my boots cleaned and brought into the room to night, and I shall want to be called at five o'clock in the morning; ask your mistress what I can have for supper; tell her I should like to have a roast duck or something of that sort; desire your master to step in, I want to ask him a few questions about the drapers of this town."

The waiter answered "Yes Sir," and then went to the landlord, and told him the gentleman in the parlor wanted a great many things, and among the rest, he wanted him, and that was all he could recollect.

Forethought.

It is said that the King of the French, fearful of a short crop at some period of his reign, has, for many years been storing away immense quantities of breadstuffs. The apprehended period has come; and now the wise king is supplying the deficiency from his well-stored granaries.

NEW INVENTIONS.

[An Excellent New Patent.

[Reported for the Scientific American by Z. C. Robbins, Mechanical Engineer, and Attorney for procuring Patents, Washington, D. C.]

For an improvement in Smut Machines.

S. W. Howlett, and F. M. Walker*; Greensboro, North Carolina, May 9th, 1846.

In this machine, the rubbing surfaces for crushing the smut and other impurities that may be in the wheat; and for scouring and removing the white caps from the kernels of the same; are formed and operate as follows:

A cast iron disc, (enclosed in a curb,) rotating on a vertical axle, has a rim rising from its periphery, with two hollow radial arms projecting from opposite sides of the same.—Within this rim (and rising to the same height) a series of segments of concentric rings are cast solid with the upper surface of the disc, having their inner surfaces fluted, as has also the inner surface of the rim of the disc. Immediately over the rotating disc and secured to the enclosing curb of the same, is placed a stationary disc. The stationary disc has studs projecting from its under side in concentric rows, having convex fluted surfaces on their outer sides, corresponding with, and placed at a suitable distance from, the concave fluted surfaces of the concentric segments, and the rim of the rotating disc. The axle of the rotating disc passes through an enlarged aperture in the centre of the stationary disc. The wheat falls from a hopper through the aperture in the centre of the stationary disc, on to the rotating disc, and as it is swept outwards by centrifugal force, it passes in succession through, and is acted upon between, the fluted surfaces of each of the concentric segments and the stationary studs. Reaching the rim of the rotating disc, the wheat enters the hollow arms—opening into the rim—and is discharged with violence against the sides of the curbs enclosing the same. Rakes secured to the under side of the rotating disc, conduct the wheat to an aperture in the bottom of the enclosing curb, through which it passes to a fan placed immediately below the same, which separates and removes all dust and impurity from the wheat. A portion of one side of the curb enclosing the rotating disc, has small apertures formed in it, and a spout attached thereto, for the purpose of carrying off the dust and impurities from the chamber enclosed within the curb.

The claims allowed in this case, cover the above combination; as they refer to, and are dependent on, the drawings, they are omitted.

Haley, Brown & Co. of Brummels P. O., Davidson Co., N. C., have become the owners of the above patent.

Improvement in Cider Mills.

Mr. C. W. D. Culp, (residence not specified) has invented a novel improvement in Cider Mills, and one that appears to be a valuable improvement. He places the press directly under the nuts or crushing cylinders, so that the ground apples fall into the tub of the press, which consists of a large cylindrical hoop perforated with holes and placed on a platform: over the centre of the tub is a single screw which passes down through the platform, and through a centre beam on which it rests, being independent of any cross-beam above. When the ground apples are to be pressed, a follower is adjusted, and this single screw is connected to the primary crushing cylinder, so as to be turned by the horse or other power which operates the mill. Patened Nov. 4, 1846.

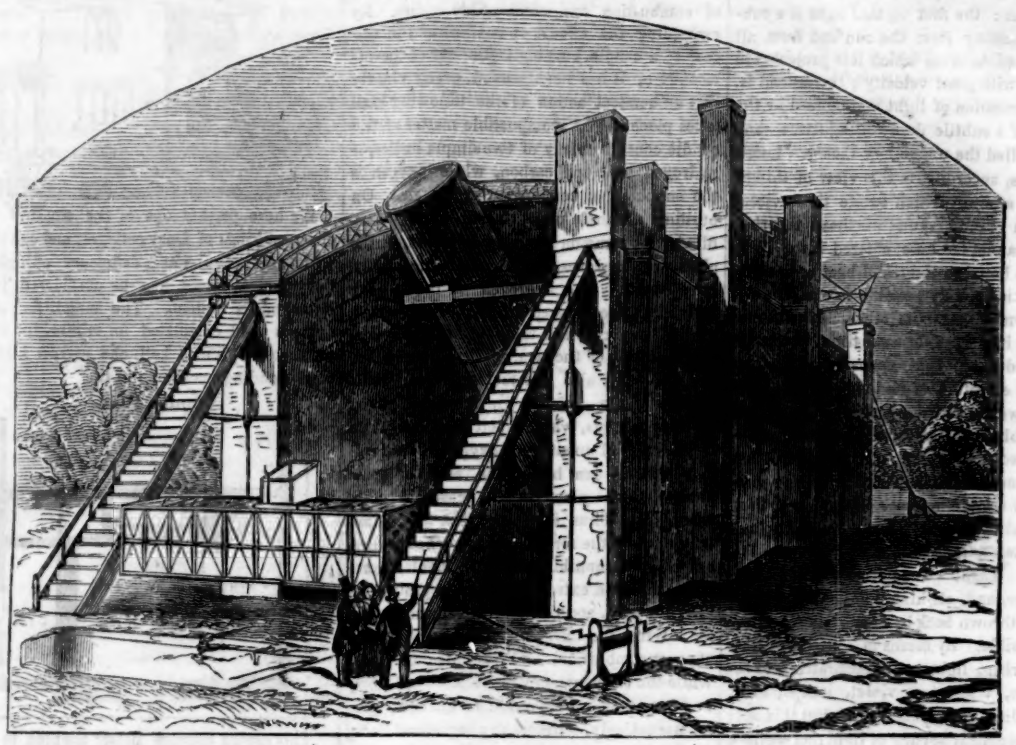
Improvement in Tuyers.

By this invention, a blacksmith can regulate the force of his blast as circumstances require, and in many cases will find it exceedingly convenient. The improved tuyer is attached to ordinary bellows, and furnished with a cylinder valve, on the principle of the key of a faucet, and which is instantly adjustable by means of a rod extending from the key lever to a handle placed near the workman. This is one of the many modern inventions, which excite wonder that they have not been thought of before. Invented by S. C, McMillen, and patented Nov. 14th, 1846.

Improvement in Coffee-Roasters.

This improvemelt was invented by James W. Cooten, and consists in an air-chamber formed by enclosing the entire furnace and roasting vessel, in an iron casing whereby the radiation of the heat from the furnace and vessel, is prevented, while the doors of the air-chamber are closed. Entered November 12th, 1846.

THE MAMMOTH TELESCOPE.



The above engraving is a representation of the great Rosse telescope, along with part of the buildings with which it is connected. In the interior face of the eastern wall a very strong iron arc of about 43 feet radius is firmly fixed, provided with adjustments, whereby its surface facing the telescope may be set very acurately in the plane of the meridian. On this bar lines are drawn, the interval between any adjoining two of which corresponds to one minute of time on the equator. The tube and speculum, including the bed on which the speculum rests, weigh about 15 tons, The telescope rests on a universal joint, placed on masonry about six feet below ground, and is elevated or depressed by a chain and windlass; and although it weighs about 15 tons, the instrument is raised by two men with great facility; of course, it is counterpoised in every direction. The observer, when at work, stands in one of the four galleries, the three highest of which are drawn out from the western wall, while the fourth or lowest has for its base an elevating platform; along the horizontal surface of which a gallery slides from wall to wall by a machinery within the observer's reach, but which a child may work. When the telescope is about half an hour east of the meridian, the galleries, hanging over the gap between the walls, present to a spectator below, an appearance somewhat dangerous; yet the observer, with common prudence, is as safe as on the ground, and each of the galleries can be drawn from the wall to the telescope's side so readily that the observer needs no one else to move it for him

The above figure represents only the upper part of the tube of the telescope, at which the observer stands when making his observations. The telescope is at present of the Newtonian construction, and, consequently the observer looks into the side of the tube at the upper end of the telescope; but it is proposed to throw aside the plane speculum, and to adapt it to the *front view*, so that the observer may sit or stand with his back towards the object, and his face looking down upon the speculum; and in this position he will sometimes be elevated between 50 and 60 feet above the ground. As yet, the telescope has no equatorial motion, but it very shortly will; and at no very distant day, clockwork will be connected with it, when the observer will, while observing, be almost as comfortable as if he were reading at a desk by his fireside.

The following are claims of inventors to new inventions recently patented, but of which we can give no description.

BY SCHROOK & FISHER.

Oct. 3d, 1846.

Improvement in Clocks.

Claim: In the time keeping part, the left pins [15, more or less] on the second wheel by which the striking part is connected with the time part. 2d: the centre balance to keep the bob from falling back of its own accord.—3d: the hook fork by means of which and the bob catcher, the bob is thrown out of the way of the upper collet of the pendulum; and 4th; the manner or means by which the power is communicated from the bob to the pendulum to give it motion, by the employment of the impulse pin and crotch. They claim in the pendulum constructing the weight and manner of regulating, and the striking part. 1st: the oscillating rack of 13 teeth, more or less, extending upwards, and working in a pinion of 16 leaves, more or less, on a vertical arbor with two hammers, to which it gives an oscillating motion, so as alternately to strike a bell to indicate the hour; and 2d: the balance which discharges the detent wire in due direction.

—

BY WILLIAM TAYLOR.

Oct. 3d, 1846.

Improvement in Boot Crimps.

Claim: The combination of the adjustable metallic jaws attached to the iron bars connected with the cross head, with the follower actuated by a screw passing through the cross head, and serving to thrust the crimp with the leather thereon, between said jaws; and the whole forming a hand tool.

BY PETER VON SCHMIDT.

Oct. 17th, 1846.

Improvement in Cotton Gins.

Claim first: the cleaner when placed in the hopper and forward of the saw in combination with the gin saws and ribs, whereby the pods of cotton are loosened and the trash cleaned out, and the unginned pods that have been acted upon by the saws are carried back to the cleaner again to be acted upon by the teeth thereof. Second, making the upper or outer surface of the ribs between the saws with a series of teeth, for the purpose of resisting the upward movement of the pods, and causing them to turn as they are carried up. Third, attaching the ribs so as to vibrate at top on a hinged joint when this is combined with the spring connection at the bottom whereby they receive a tremulous or vibrating motion to carry the pods towards and from the saws. Fourth, the series of permanent brushes below the rotating brushes and saws, for brushing the fibres and more effectually removing the motes and other impurities therefrom; and in combination with this, I further claim the grate and discharge passage for the motes and other impurities below the permanent brushes. And, finally, I claim, in combination with the rotating brushes, the spiral or oblique fan followers at each end for the purpose of introducing, within the brushes, currents of air to discharge the fibres from the brushes, and to carry out the motes and other impurities.

—

BY PRAY & STAFFORD.

Nov. 12th, 1846.

Improvement in Drawing Frames.

What we claim is making each section of the first or back set of draw rollers of a drawing frame conical for the purpose of regulating the size of yarn or roping. We also claim the vibrating condensing tube in combination with the conical draw rollers for the purpose of operating the guides to guide the roving in its passage to the conical rollers

BY WILLIAM READ.

Oct. 24th. 1845.

Improvement in filtering stop-cocks.

Claim—placing a filter in an enlargement or chamber of the stop-cock, between the valve and delivery spout; when these are connected by screwing on each other, and provided with packing, so that the pressure of the column of water shall press the filter against it and thus form a water tight joint, whereby the filter can be removed or reversed for cleaning and the stop can be used independent of the filterer.

—

BY MELVIN M'KAY.

Nov. 14th, 1846.

Improvement in Tuyeres.

What I claim is combining the nozzle boxes with the curved air tube in such a manner that their position can be so adjusted as to bring their discharge apertures nearer to or remove them farther from each other, thus adapting them to fires of different magnitudes of a greater or less degree of intensity.

—

BY ELISHA HALE.

Nov. 14th, 1846.

Improvement in Water Wheels.

What I claim is putting the valve, into and out of action, by the united effect of the attached drivers, the eliptical raised circle, and the grooved block.

—

BY A. H. BESCHERMAN.

Nov. 15th, 1846.

Improvement in Handling Hides.

What I claim is the application of rollers in combination with an apron or endless web, and constructed to operate within competent vats or enclosures when such application, combination and construction is employed for the separate or several and successive purposes of washing, liming, bating, tanning, stuffing or dubbing hides.

NEW YORK, NOVEMBER 28, 1846.

Isthmus of Panama.

Mr. Wheelright, an American, who is superintendent of the English Pacific Steam Navigation Company, has published his views, from personal observation, of the passage across Panama. He is in favor of making a road from Chagres across to Panama, on which he could transport passengers from the steamers in the Pacific to those in the Atlantic in six hours. Steamers on the Atlantic side can pass up to the river Chagres, which is navigable for vessels of 700 tons burden. All that has been done already in the premises he does not think has advanced the object a single step.

Mr. Wheelwright is evidently correct in his opinion. Let a permanent double track railroad be constructed and supplied with 32-wheeled ship cars, and ordinary merchant vessels may be transported from the Atlantic to Pacific, or vice versa in from ten to twenty hours.

The Magnetic Telegraph.

The following facts concerning the extension, actual and proposed, of Morse's Magnetic Telegraph, are contained in a letter addressed by Mr. Kendall, who is accurately informed on the subject, to the Ed itor of the Government paper:

"The conviction is now general that the telegraph must have stronger conductors than copper wires; and the Washington and Boston companies are preparing to cover their lines with iron. An iron cord has been up during the season from Philadelphia to Baltimore, and with far superior strength, is found in every other respect to answer the purpose as well as copper.

"Lines have been built from Boston to Lowell; from Troy to Saratoga; from Syracuse to Oswego; from Auburn to Ithaca, which is progressing to Elmira; from Buffalo to Lockport, which is to be extended to Lewiston, to be connected across the Niagara, with a line to Toronto; from Philadelphia to Harrisburg, to be extended to the West. This is covered with a beautiful iron cord. The length of the lines now constructed is about 1,300 miles.

"A line is in progress from Boston to Portland. Preliminary steps have been taken for the construction of a line from Buffalo to Detroit, and thence through Chicago to Milwaukie, a distance of about 800 miles, to be finished in fifteen months. The New-York and Washington company, having obtained the right of way along the railroads through New-Jersey, are rebuilding their line on the direct route, and expect in two months to have up two good iron wires from New-York to Baltimore.

"A line will be immediately put up from Washington to Petersburgh, Va., if there be no difficulty about the right of way; and none is apprehended. An effort will be made immediately to raise the necessary funds to carry the Southern line through to New-Orleans next season."

The Capture of Monterey.

Of the importance of Monterey as an acquisition to us there can be no real difference of opinion. That it must prove a very serious loss to the Mexicans may be inferred from the fact that it was the place where the foundries for the casting of the copper balls—cannon and musket—are erected. In its vicinity are the copper mines which excel any other in productiveness, and from these the foundries are supplied with metal for their castings.

Prairie Navigation.

A letter from Independence says: "We have a man here building a wagon to run over the Prairies to Bent's Fort, to be propelled by wind. He makes masts and sails to it, and expects it to run at the rate of fifteen miles an hour. He expects to have it finished it time to go out once this fall, and *blaze the way.*—*St. Louis Rep.*

FOREIGN CORRESPONDENCE.

No. II.

New Telegraphic Despatch—Street Railway—New Process of Printing—Cotton Gun—Improved Knapsack, etc.

LONDON, Oct. 23, 1846.

My dear Sci.—

A new and improved Telegraphic despatch has been invented, and its capabilities demonstrated before a "competent scientific committee." It is calculated for large cities especially, and will enable persons to make in four or five minutes, such communications as now requires as many hours. The detail has not yet reached the public, but a gentleman in connexion with one of the London papers, who was present, assures me that the trial was eminently successful, and that experiments on a large scale, as soon as the proper company is formed, will be made through some of the principal streets. As a system, it involves one grand central depot, from which there may branch as many as there are populous or business sections of a city. Communications are to be made either at the central depot or any of the branches to such sections as are embraced within the circle of the Telegraph, which will be defined by giving a certain district to each branch. By an automic process, these communications will be written at the extreme point for their delivery, where a thoroughly organised corps of messengers are always in waiting, and when the message is written, which will be done as rapidly as a clever penman would do it, the principal of the central depot or branch, who is sworn to secresy and subjected to very heavy bonds—has only to fold, seal and superscribe the same, when the messenger bears it to its destination. It is believed by those who have thoroughly examined the invention, that it must absorb a large share of the present Post Office despatch, and that transmission being equally cheap, if not cheaper than by the penny system now in use, the poorest will be enabled to enjoy its facilities. That such a scheme may be made, if successful, a tremendous engine for strengthening the arm of civil power, and adding to the safety of large cities, no one can doubt. A fire in the most remote part of London, is instantly telegraphed to every other part—a riot in the suburbs communicated in a few seconds to the different barracks and police stations—information of robberies, murders, or other crimes circulated so suddenly through every avenue of the city, that a man, even fleet as Jonathan Wild, would stand a poor chance of escape. Besides, persons suddenly taken sick, or at the point of death, would be able to annihilate time and space, at a moment when every hope depended upon despatch. In fact such a communication would be opened between the heart and extremities of the city, that people would sway next to prescience in all their business and other affairs, no matter how wide and diversified. In connexion with this, it is also proposed to establish railway omnibus trains in those thoroughfare streets where the telegraphic wires are arranged. This is to be done by throwing up a continuous colonnade thro' the street or streets, the pillars flanking the outside of the foot pavement and rising to the base of the second story of the houses. This portico is to be floored and laid with wooden or iron rails, on which the omnibusses in trains are to be propelled by atmospheric pressure, so that there shall be neither steam, smoke nor dirt to deface the buildings or interfere with persons above or below. A strong and tasteful iron railing will be attached to the outside of the portico and two slighter ones just outside the omnibus track, forming an enclosed footpath on either side. By this arrangement it is believed that the value of property will be enhanced, the safety of life increased, a vast amount of filth avoided, and the general good of the public facilitated. Still above this, the telegraphic wires are to be arranged, so that if there is an annoyance in either of these schemes, it may be confined to as few channels as possible, You have long been discussing some plan to relieve Broadway of its pressure, though you know but little of crowds, even in that thronged thoroughfare, if you compare it for a moment with some dozen to be mentioned here. I see no plan half so feasible and clever as the one proposed for London. It does not in the least interfere with the street, while your "middle of the road" concern would—and you have by its means, only to step from your door into a conveyance that will take you all over town, if the arrangement were carried out, without ever needing an umbrella. And the rates of fare under such an establishment could be safely reduced one half—such is to be the case here. When I first saw the steamers on the Thames, I thought that would eventually be the system for a vast deal of travel in New York, but a second view teaches me that your ferries will always cross the rivers, instead of running up and down. The Thames pierces through the heart of London, where the great crowd naturally tends; your rivers are on the edges where but little travel can ever be induced, and there lies the reason why you must look for relief in the streets.

Two other new inventions or discoveries are now largely on the conversational tapis. One is the Anastatic process of printing, which, though brought to light some yaars ago, was then unsuccessful from want of perfectness.—This obstacle has since been overcome, and I have seen a specimen of a book now out of print, restored as it by lithography on plates of copper. The idea was first put in form by M. Baldamus, a native of Berlin, Prussia, and consists simply in transferring the ink of the original page to a copper plate, where by a chemical process it is perfectly indented, and the most minute letters and engravings are reimpressed with the nicest fidelity. A patent for it has been obtained in England, and a steam press invented for its use, by which 1000 copies per hour can be taken. If carried extensively into practice it will prove one of the most interesting discoveries of modern times, as by it, the rarest old books can be renewed *ad infinitum*—also music, and manuscripts of every kind, Books printed by this process cannot but be cheap, beyond all our present rates, since the composition of type is entirely dispensed with. "Bibliopists," says a writer upon the subject, "and possessors of 'unique' copies must for the future, be upon the *qui vive*, lest some fine day the world should be inundated with impressions of their cherished authors through the medium of this process."

The other invention is a preparation called "Gun Cotton," which in the same number of grains possesses, besides other advantages, twice the strength of powder. Its author is a Professor Schonbein, of Basle University, and several experiments have been made in presence of the most distinguished scientific men in England, and leading members of the East India Company, and the results obtained are astonishing. Its inflammability is superior to that of powder, as proven by laying a heated wire upon the cotton and powder at the same time, when the cotton only exploded. This new combustible, it is said, leaves no smoke, smell or residuum, and may be fired by any of the processes used for powder, while its immersion for any length of time in water, does not militate in the least against its properties. In the course of the experiments at Stanmore, a piece which had been immersed sixty hours in water, was taken out, dried, and found to possess all its original inflammability and strength. It has all the appearance of common cotton wool. Several shots were made with the same quantity of powder and cotton, after which the cotton was gradually reduced. A rifle charged with 54 grains and a half of powder sent a ball through seven boards half an inch each in thickness, at a distance of 40 yards; the same gun, charged with 40 grains of the cotton sent the ball into the eighth board On a subsequent trial with a fresh rifle at 90 yards, 40 grains of cotton carried a ball through eight boards. What is to be the next means for facilitating bullets and cannon balls? This cotton will unquestionably, in many cases, take the place of powder, if only for its quality of withstanding the water. Many a battle has been decided by a "flash in the pan," and a whole army made comparatively harmless by by a heavy continued rain. It will be so no longer, and therefore the world must hail the new instrument of death just announced. The East India Company, I understand, have taken Professor Schonbein under their especial protection.

In connexion with this last discovery, it may not be out of place to mention a newly invented Knapsack, which while knapsacks must be worn, ought to come at once into general use. The body of the knapsack is not changed, and the improvement consists entirely in the manner of attaching it to the shoulders. The present system is by loose cross straps, which allow the knapsack to slide down into the hollow of the back, or upon the soldier's hips, making it an impeding and galling burthen. The improvement is a couple of half circle steel bands, with one end of each fastened by a button and spring to the outside and upper edge of the knapsack, while the other is sprung over the shoulders and secured by a belt passing round the body. The springs or bands are sufficiently strong to hold the knapsack firm on the shoulders, and it is believed a soldier can easily travel one third farther by means of the improvement in a day than by the old system of straps. Those brave fellows whose feet are now stirring the dust in the land of the Montezumas, and who have made Palo Alto and Resaca de la Palma famous by deeds worthy a Marathon, merit whatever of comfort or convenience can be added to the camp and "tented field," and nothing would lighten their valorous shoulders more than this improved knapsack. It is to be adopted at once in several of the British regiments. But whether the invention, be Gun Cotton, improved Knapsacks, Anastatic processes, Telegraphic despatch, or atmospheric propelled Omnibusses, let every man look well and think well that none of these are allowed to interpose between the humanity that now stalks upward, lifting all men, and that splendid destiny, which, by peaceful appliance only, of all inventions, it may ultimately attain. S. D. C.

The Columbian Magazine.

The December number of this favorite monthly has made its appearance, and surpasses all its precedents. It is embellished with three elegant engravings, one of which, the "Laying down the law,"—a mezzotint by H. S. Sadd,—is a masterpiece, and is alone worth the price of the number. One of the best songs of the season, "The Persian wife to her husband," with music, is also contained in this number. Published by Israel Post 140 Nassau St.—$3,00 per annum.

Illustrated Botany.

No. 9 of this "unrivalled in splendor" periodical, cannot be duly appreciated without being seen. It contains four plates of flowers colored with great brilliancy, in which are represented the Tussilago Fragrans, German Iris, Indian Jasamine, Laurestine, Daisy and Horse Chesnut. No family that resides in the country, should be without this interesting work; and to those who reside in cities, where they have no opportunity of seeing the botanical beauties of nature, it is nearly indispensable.—By J. K. Wellman, 116 Nassau st.—only $3 per volume at 12 numbers

Monson Academy.

We would call the attention of our readers to the advertisement in another column, of this excellent institution. It is situated at Monson, one of the prettiest little villages in Massachusetts, and under the care of its talented principal, Rev. Charles Hammond, is regarded as one of the best Academies in the state. It is devoted to Classical and English studies. As a thorough school for young persons, it deserves a liberal patronage. Further information will cheerfully be given on application at the office of this paper.

To New Subscribers.

Those subscribing to the Scientific American will be furnished, if desired, with all the back numbers of the present volume. Bound together at the end of the year, they will form a handsome and valuable work.

THE
SCIENTIFIC AMERICAN.

Persons wishing to subscribe for this paper, have only to enclose the amount in a letter directed (post paid) to

MUNN & COMPANY,

Publishers of the Scientific American, New York City.

TERMS.—$2 a year; ONE DOLLAR IN ADVANCE—the remainder in 6 months.

Postmasters are respectfully requested to receive subscriptions for this Paper, to whom a discount of 25 per cent will be allowed.

Any person sending us 4 subscribers for 6 months, shall receive a copy of the paper for the same length of time.

Manufacture of Iron.

A series of Practical Experiments highly interesting to Iron Manufacturers.

BY M. AUG. MALBERG.

[From the Bulletin du Musee del l' Industrie.]

(*Concluded from No. 9.*)

After having thus convinced myself by experience that iron acquired a granular texture when heated to a very high temperature, I made experiments with regard to the manner in which it was effected, as to whether certain results could not be obtained in working.

In order to assure myself whether simple heating without hammering would produce a change, I caused the bar No. 5, before mentioned, which had been heated to a very high temperature in the welding furnace, to be cut into two portions; one of these portions was brought to a red and the other to a white heat, but not to a welding heat: I had previously hammered portions of these two bars, and I repeated this operation upon the bars after being heated. In one of these portions (that which had been brought to a red heat) the fractures of the parts hammered in a cold and a hot state, were identical—both were granular and crystaline; the resistance offered when struck upon the edge of the anvil was also very considerable, both before and after heating, which had not been supposed from inspection of the fracture. The color was the same in the other portion carried to a white heat, and it was not different from the former either in the fracture or resistance. I also caused the bar No. 4, which had been first heated in the welding furnace, and then carried in the same furnace to a moderate welding heat, to be cut into two pieces, one of which was heated to a white and the other to red heat. The results with both these portions were identical, after heating and under the hammer, as respects the fracture, the color, and the resistance. The conclusion from this would seem to be, that re-heating iron to a heat less than full white heat has not any injurious influence upon the metal.

In order to get a correct idea of the changes which the iron undergoes when worked at a heat less than the welding heat, I took a certain number of bars, which I rolled out to a good red heat, and I remarked that the ductility, and also the absolute resistance and limit of elasticity were thus augmented in the iron, which is in accordance with a well known fact, viz:—that iron thus treated, when broken upon the edge of the anvil, presents less resistance, which is owing to an increase in density, and also to the fact that the iron, having thus lost part of its elasticity and tenacity becomes of a more brittle and rigid nature. My experiments on this head were made upon bars from an inch to an inch and a half in thickness, and consequently the results were not, perhaps, very conclusive, for which reason I will not enter into the details; but, as some experiments have been made upon pieces of larger dimensions on the Rhine railway, I will mention some few which appear worthy of notice.

A rolled axle, with forged pins and welded shoulder, was submitted to the action of the monkey, in such a manner that one of its spindles received the blow, the monkey falling from a height of 26 feet. The spindle was broken, and the axle bent and crushed, and the shock was such that the other spindle was broken and thrown up a height of more than 12 yards. The fracture in the spindles was grey, of a rather fine granular texture; one of them, however, contained a layer of crystaline iron.

An axle, consisting entirely of rolled iron, was hammered at one end, while in a hot state, but so as to lose none of its strength.—The monkey was allowed to fall upon it from a height of 16 feet, at a distance of an inch and a half from the forged end. The rolled part of the axle was somewhat curved, but the wrought portion was scarcely affected. The axle was then hammered all over, and left in the open air all night. The next day, on being again submitted to the monkey, from a height of 16 feet, it broke in the middle, and bent very little. The fracture was found to consist of a crystaline granular texture, of middling size and light color.

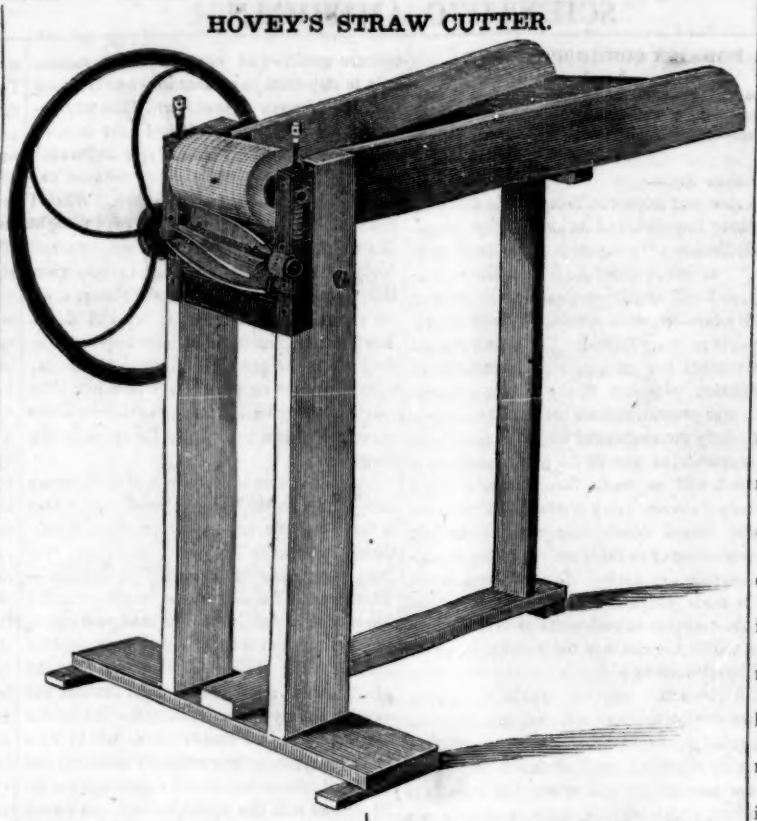
In these experiments it will be observed, that the axles were broken by the fall of a heavy weight, which is the reason that the faces of the fracture appeared more crystaline. If they had been broken by blows with a small hammer, this would not have been the case; at least I have never found, although I have made a great many experiments on this head, that by hammering at a red heat, (when the iron had not been submitted to any operation, of a nature to deteriorate it) the fibrous texture has disappeared. When, however, the rupture is effected by the monkey, the fibres of the iron, rendered dense and brittle, separate violently and instantaneously, and the fracture acquires a granular aspect, but the fibre is nevertheless not destroyed. The drawing out of the iron into rods is a conclusive proof of this, and another experiment on the Rhine Railway furnishes further evidence of the fibre not being injured.

In order to ascertain whether rolled axles which are submitted to a second welding heat and hammered by hand would thereby lose their tenacity, an axle was broken with small hammers in the part wrought. The fracture presented no alteration, but was, on the contrary, remarkably fibrous and tenacious. It is, therefore, evident that this case is not precisely similar to the preceding ones, and yet the iron has been hammered at a welding heat.—It may, therefore, be concluded from this experiment, that when the hammering is not very violent, and the iron is not worked at a greater heat than red heat, it will not be rendered brittle, and this result I have always seen confirmed in working large pieces.

It now only remains to inquire how to avoid rendering iron brittle by hammering, and if that be not possible, how that effect may be made to disappear. Iron is always brittle in some degree, but hammer-forged iron is always denser and harder. When, however, the hammering is performed at a low welding heat, and when, on being re-heated, it is not raised above that temperature, the hammering will have but little influence in augmenting its brittleness. If, through necessity or negligence, iron has been worked at a low heat, the brittleness may be diminished by heating the iron to a dull red, and letting it cool slowly, as has been proved by Nasmyth's experiments. Is is not easy to determine whether by re-heating, the cohesion or tenacity of hammered iron is diminished in the same degree as rolled iron, for in neither can the action of the various influences be distinguished, and a comparison is, consequently, impossible. According to the experiments of M. Brix upon the resistance of rod iron, the absolute resistance of the rods, which had been reheated was never less than the resistance of the bar-iron from which they were drawn. My observations upon the re-heating of iron render it probable that drawn iron is, in a slight degree, softer than before that operation. But, as in the latter case, the absolute resistance had somewhat diminished, I have not yet had time to asusre myself by direct proof, although the density had evidently augmented.

Ii is seldom neceasary to submit bar iron which is to be exposed to various causes of rupture to cold hammering, and it is never indispensable.

HOVEY'S STRAW CUTTER.



There are few subjects in the line of labor saving machinery, in which there is so much competition at present, as in machines for cutting straw and hay. We have recently given some attention to machines for this purpose, examined the construction of various kinds and seen them work side by side; and we have no hesitation in saying that the machine represented in this engraving, is entitled to the preference over all others that we have seen, with regard to the effect of its operation and the facility of keeping it in repair. The principal peculiarity of this improvement consists in a set of spiral cutters which are attached to a cylinder in such a manner that they can readily be elevated or depressed by means of set-screws. as occasion may require, in order to keep the edges thereof adjusted to come in contact with the periphery of another cylinder in their rotations. By passing the hay or straw between the two cylinders, it is cut up fine enough for feed, and at the rate of two bushels per minute. The cost of the machines varies from $9 to $20. Specimens may be seen in operation at 189 Water street. Invented by William Hovey, Worcester, Mass.

"I Am."

Illustrated by Bishop Beveridge.

"I AM." "He doth not say, I AM their light, their guide, their strengthening tower, but only "I AM." "He sets as it were his hand to a blank, that his people may write under it what they please that is good for them. As if he said, "Are they weak? I AM strength. Are they poor? I AM riches.—Are they in trouble? I AM comfort. Are they sick? I AM health. Are they dying?—I AM life. Have they nothing? I AM all things, I am wisdom, and power; I AM justice and mercy; I AM grace and goodness; I AM glory, beauty, holiness, eminency, supereminency, perfection, all-sufficiency, eternity. JEHOVAH, I AM! Whatsoever is amiable in itself, or desirable unto them, that I AM.—Whatsoever is pure and holy; whatsoever is good or needful to make men happy, that I AM."

Increasing Money.

It has been remarked that a person who folds a bank note not only *doubles his money*, but that the more he folds it the more he will find it *increases*.

New Definitions.

Animal Magnetism—Making an ass of one's self.

Antiquarian researches—An editor looking for news among his exchanges after two day's failures of the mails.

Carving—Cutting an old acquaintance whom you know to be under the weather.

Civility—Sending a man a challenge, and telling him at the same time that you are his "obedient servant."

Dancing—The antics of peas upon a hot shovel, erroneously called "the poetry of motion."

Harmony—The singing of the tea-kettle while you are reading the morning papers.

Generosity—Exerting yourself to get up a subscription for a benevolent purpose, but forgetting to contribute to it.

Indignation—Men of straw burning a straw man.

Liberality—Giving every one liberty to think on matters of religion and politics as—you do.

Music—A child crying for its "ma" in church.

Penetration—Looking at an eclipse of the moon through smoked glass.

Phrenology—An Irishman operating on a man' head with a shillelah.

Physiognomy—An Indian tracing lines on his face with red paint.

Poetry—The jingle of silver dollars in a man's pocket.

Imitator—A fop or dandy: the *original* being a monkey.

Immaculate—Without spot; a white gander for instance.

Immediately—Very soon, if not sooner; instantly, if not more so.

Immemorial—further back than Memory can see with a spyglass,

Immense—Almighty big, as the little red ant thought of the cockroach.

Immersion—A rite performed by frogs, and others.

Immoderate—Eating the whole of a turkey at dinner, then burying it beneath a peck of plum pud ling, and moistening the heap with a gallon of beer.

Imp—A little, dirty, insignificant devil, not out of his teens. The *bottle-imp* is the invisible *spirit* of rum. People 'get the devil in them' by swallowing him in a toddy.—*Sund. Mer.*

Self Torment.

As the following whimsical anecdote, which has been recently revived, is somewhat satirical we give it an insertion.

A lady visiting her kitchen, found her servant girl sobbing violently and the oven, which had been heated was nearly cold.

"Why Betty, what is the matter with you?"

"O, Marm, I had just got the oven nicely hot,"—

"Well, did you burn yourself with it?"

"No Marm, but I just happened to think,"

"Well, well, Betty tell me what you did think?"

"That if ever I should get married"—

"You would not cry at that certainly"

"And should have a dear little child"—

"Well proceed, Betty, proceed;"

"And it should just go alone, and I"—

"You would be pleased to see it, no doubt;"

"Should get the oven hot, and should leave it"

"So you have left it now, but no harm;"

"And the baby, should crawl in bo-o o"

"The dear little thing would burn to death, Oo, hoo,"

Very Pious.

Some gentlemen of the Bible Association lately called on an old woman to see if she had a Bible, and were severely reproved by her.—"Do you think, gentlemen, that I am a heathen, that you should ask me such a question?" Then addressing a little girl, she said, "run and fetch the Bible out of the drawer, that I may show it to the gentlemen." The gentleman declined giving her the trouble, but she insisted on giving them *secular demonstration* that she was no *heathen*. Accordingly the Bible was brought nicely covered; and on opening it the old woman exclaimed.—'Well, how glad I am that you have come.—Here are my spectacles that I have been looking for these *three weeks*, and didn't know where to find 'em!"

Interesting from the Army.

On the 13th instant, there were two arrivals at New-Orleans from Brazos Santiago, with intelligence from Monterey up to the 24th ult. At Monterey the weather was cold, and chills and fever prevailed in the camp in the city. It was healthier in the camp outside of the city. There was much sickness at Camargo and down to Point Isabel. A number of the wounded had died; but the greater portion were doing well. Ampudia and his troops had retired beyond Saltillo, without fortifying the passes, but though the roads are all open, Gen. Taylor cannot proceed without reinforcements.

Still Later.

The Mexicans having evacuated Saltillo, and thrown their whole force into San Luis Potosi, where Santa Anna is fortifying himself, San Luis will now become the next great point of attack, unless Santa Anna makes a movement in some other direction. General Taylor will move with his usual caution, and whatever reinforcements he may require, will be promptly forwarded.

From California and Santa Fe.

We have news from Santa Fe up to October 14th. General Kearney when about 175 miles from Santa Fe was met by an express from Colonel Fremont, informing him that the whole of California was in the possession of the Americans; the Mexicans being driven out of the territory. General Kearney accordingly sent his troops back to Santa Fe, with the exception of 100 picked men, with whom he continued onward. Major Fitzpatrick has arrived at St. Louis on his way to Washington with dispatches from Commodore Stockton.

Capture of Tobasco.

On the 24th ult. five small armed vessels ascended the the Tobasco river to the city of Tabasco, a distance of 75 miles, and took possession of several vessels. The city was summoned to surrender, but the Governor refused, and the Americans were fired upon from the shore, and one American officer was killed.—The fire was returned from the vessels, and the city was nearly destroyed.

A strong Castle.

The castle of Juan D' Ulloa, is said to mount 204 heavy guns. The English naval officer on that station has said that England and the United States have not ships to take it. It must appear evident to every scientific man who examines the subject, however, that this castle might be readily destroyed by a single steamer, of moderate size, armed with the "Battering engine" described in a former number of this paper, and which would cost less than $8,000. The present mode of naval warfare is, and will eventually so appear, as decidedly awkward as would be the manufacture of iron by the tools of a common blacksmith.

A Wonderful Meteor.

A correspondent of the N. Y. Sun writing from Loweville, this state, Nov. 12th, states that on the previous evening the most remarkable meteor ever seen in that section made its appearance from the west It appeared larger than the sun, illumined the hemisphere nearly as light as day. It was in sight nearly five minutes and was witnessed by a great number of the inhabitants of that village, and finally fell in a field in the vicinity, and a large company of the citizens immediately repaired to the spot and found a body of fœtid jelly, four feet in diameter. This strange substance was about to be analysed, and we shall probably hear something further on the subject.

Tremendous Explosion.

Beatty's powder mills situated about seven miles from Baltimore, were blown up on Monday morning, and the report thereof was so heavy as to shake the city of Baltimore, and to break many of the glass windows. Three large buildings were shattered in fragments over ten acres of ground. Of five men who were in the mill, nothing can be found but fragments, some of which were found 100 yards from the place. The quantity of powder exploded, was about 5000 lbs.

[For the Scientific American.]

Chemical Health.

On page 53, I suggested a few thoughts on what was termed Mechanical Health. I now submit a few lines on the state of our bodies, as affected by chemical agencies.

The vegetable and animal world exhibit unceasing and wonderful phenomena. One of the greatest wonders of the world is a seed—containing the germ, the embryo, the living principle of a plant destined to be fully developed and to bear both flower and fruit. Over the whole face of the earth seeds give existence to innumerable varieties and countless numbers of plants that are continually undergoing changes until their elements are lost in transformations into an infinity of vegetable and animal substances. However prolific and admirably adapted is the earth to provide sustenance for all these ever living and ever dying wonders, yet if there is present one substance foreign to the nature of any one kind, it dies out, or has a sickly growth. Although the soil readily yields of its abundance of nutriment, yet those who sow in the expectation of reaping are careful to apply nothing uncongenial to the health of the object of culture.—After having done all in their power they feel wholly dependent on the purity of the air, the quantities of the dews and rains of heaven, the proportion and degree of heat, and the thousands of silent changes and combinations requisite to produce an abundant and healthful yield. An apparently slight and undiscoverable cause may produce effects that may make nations tremble and convulse the whole business world. Witness the undiscoverable cause of the potatoe rot. If such unceasing care is requisite for healthful vegetation, and if such dire consequences proceed from slight and unseen causes, how much greater is the necessity to guard the health of animate existences, whose natures are so very compound and subject to so many internal and external agencies! We see individuals and multitudes over the whole face of the earth, exhibiting the sickly and deadly effects of the presence of uncongenial or disproportioned elements. Witness the cholera and the thousands of other diseases caused by the deranged apportionment in the elements of nature and by the violation of the laws of health. The whole physical world is a vast labaratory of decompositions and combinations. Our bodies may be considered as minor and locomotive labaratories, exhibiting an uninterrupted succession of interesting and remarkable chemical actions. Every inhalation of atmosphere is followed by successive decompositions and combinations. When coming in contact with the blood loaded with deadly carbon, it instantly disengages the carbon, supplies oxygen and sends it on its course through the system. This chemical change is probably the cause of heat, and thus at the very outset is a double action of vital effect.—Who can doubt the importance of a pure atmosphere to every inhalation? What chemist in so nice an experiment would allow the presence of the least foreign mixture? Who that glories in being a Man, the creature and image of God, would unnecessarily drink in air less pure than was deemed requisite by its Maker to perform its numerous and wonderful offices in the body? Alas! how many there are who do violence to their nature and degrade themselves. Does not the very blood of the body cry out against him who for hours, and on repeated occasions, inhales the air of a groggery or crowded bar room poisoned and heated with tobacco fumes and breath contaminated with burning liquors? Is it possible that such violence to nature can be otherwise than destructive to the beauty and health of the body? Let us all remember that one of the most striking and important discoveries in chemical science is, that the least variation in the quantity of one ingredient results in producing a compound of totally different quality. Thus a wholesome substance by the least possible change in its constituents may become a deadly poison; and some substances will not act on others unless they are in certain quantities and conditions. However pliant and resuscitative may be nature in her operations, yet every departure from her laws produces its effects.—Unwholesome food or an excess in quantity taken into the stomach for once in a whole life affects the whole body to a degree that disturbs the operations and excites the sympathies of every portion. How desirable then is it that we should listen to the voice of nature in reference to the kinds, quality and quantity of substances put into our stomachic laboratories.

S. F.

Cotton Powder.

Capt Mordecai of the ordinance department at Washington, in a report to Col. Talcot, gives the facts of an experiment made with the explosive cotton in which he states that gun-cotton seems to produce in the musket an effect equal to about twice its weight of good rifle powder. The report is sharper than that produced by gunpowder. This discovery, however, appears likely to be of little avail to the inventor as it is now reported that other fibrous substances, or even saw-dust may be prepared, even in a cheap way, so as to explode like gunpowder.

Storm on the Lakes.

A terrific gale occurred on Lake Erie on Monday last, and proved extensively destructive to steamboats and other vessels. It is supposed that thirty or more have been wrecked. Many dead bodies have been thrown upon the shore.

5000 2 25 0000
250 1250,00
250000

The Manufacture of Glass.

Continued from No. 9.

All glass requires annealing, or cooling; the process is performed in a furnace called a lier from the French *lier*— figurative, perhaps of the change in state as well as atomic arrangement, which takes place during the cooling.—We know that a change does take place, from the fact that glass before cooling is of greater bulk and less specific gravity than when cold, that it parts with a portion of color during the process, probably by giving off oxygen, and that though, whilst in a fluid state, glass is a good conductor of electricity, when cold it is a non-conductor. The object of annealing is by a gradual diminution of the temperature to allow of that arrangement of particles necessary for the body at low temperature, and which particular arrangement alone enables the glass to support sudden changes. The base of all glass is silica; the most convenient form in which it is found is in fine sand; upon the due proportion of this substance in glass, depends its compactness of body, brilliance, and capacity to withstand sudden changes. It often happens, either on account of want of sufficient heat in the furnace, or in order to save time in the melting or founding, that too small proportion of silica is employed. Glass which has this fault may be known by its rapidly attracting moisture. The different kinds of glass made, are known by the names of plate glass, German sheet or British plate, crown or window glass, bottle glass and flint glass; there are others but they are merely modifications of these, and need not be noticed. Plate glass is composed of sand, carbonate of soda and chalk, with small quantities of arsenic and manganese; the proportions vary at different works, but the general proportion is—Lynn sand 400 carbonate of soda 250, ground chalk, 35, by weight. The quality of the glass depends upon the quality of the alkali. Plate glass is melted in large open pots. The furnaces are square, containing sometimes 4, sometimes 6 pots each. When the glass is melted, which takes 22 hours, it is removed to another furnace, where the pots are smaller, of cylindrical form. Here it is fined, which occupies from 4 to 6 hours, and when free from air bubles and impurity the pot with the glass is removed bodily from the furnace by means of a crane and hoisted to the end of the casting table, upon which the glass is emptied, a large iron roller which works inside the flanches of the casting table is then made to pass over the melted glass, in order to flatten it out, it is then removed upon a wooden table on wheels to the annealing arch which is now at a high temperature, and here it is excluded from the atmosphere until cold. The glass is rough and uneven, but it is afterwards cut flat by machinery and then smoothed and polished; it is these processes which render plate glass so costly. Crown, or window glass is of much the same composition as plate glass, except that a cheaper description of alkali is used; the ordinary mixture is 500 cwt. Lynn sand, 2 of ground chalk, and 1 *each* of sulphate and carbonate of soda. The square furnace and the open pots are used, there being generally 6 pots on each furnace. It takes from 14 to 20 hours to melt this glass, and then it requires to stand 4 to 8 hours to allow it to become free from all air bubbles and to cool sufficiently for working. Window glass is formed by blowing: upon the blowing iron is gathered, at three several times (the fluidity of the glass never allowing fewer) the weight of glass necessary to produce the table and which weighs 11 pounds, this is then blown out, leaving a solid lump at the furthest extremity from the blowing iron for attaching the punty, this is called the bullion. The punty being fixed to the bullion, the blowing iron is relieved by merely touching the glass with a wet iron; being firmly attached to the punty, it is removed to a small cylindrical furnace, called a flashing furnace where a rotary motion being given to it, increasing as the glass becomes softened by the heat, the centrifugal force, together with a little slight of hand on the part of the workman, produces a flat circular plate or table, as it is then called.

British plate or German sheet glass is of the same composition as plate glass, but the manipulation is different. The glass is blown into open cylinders, and, when cold, these are cut open along the length with a diamond, and placed in a flatting furnace, which is at a sufficient heat to bring the glass into a semi-fluid state, so that it falls quite flat. The sheets thus made are afterwards cut flat and polished. The size of the sheet is restricted to what can be blown and worked by one man; it is cheaper than plate glass because all waste is avoided and less cutting is required. Bottle glass is composed of the cheapest materials which can be procured—ordinary pit sand, refuse alkaline waste from soap works, refuse lime from gas works. &c. The proportions of the materials vary according to quality. Bottles are blown in moulds; the glass having been blown in the mould nothing remains but to form the mouth; this is done, the bottom being attached to an iron punty, by holding the extreme edge of the neck to the heat for a short period and having collected a small quantity of liquid glass upon the end of a small iron called a ring iron a ring of glass is allowed to cover this extreme end and this is afterwards worked into shape by a machine which forms the inside and outside of the mouth at the same time merely by the workman turning the bottle on the iron upon his knee once or twice. The rapidity with which bottles are made is almost incredible—a workman with the assistance of a gatherer and a blower will begin and finish 120 dozen of quart bottles in 10 hours, which averages nearly 2 1-4 per minute and this is ordinarily done, and in some works the men are restricted to 3 per minute to prevent the work being slighted. It may not be uninteresting to observe the low price at which this description of glass can be produced, now that the duty has been removed: quart bottles can be produced at the (English) works at about 14s. per gross, each gross weighs 2 cwt. which is equal to 7s. per cwt. or 7*l*. per ton for manufactured bottles; if from this we deduct, for workmen and incidental expenses 2*l*. per ton, it would leave the price of bottle glass at 5*l* per ton.

To be continued.

The Vauxhall Balloon.

This balloon, says a recent number of the London Mechanic, has ascended several times merely to gratify the curiosity of the inhabitants of the metropolis; on Monday last it ascended for an unusual purpose, viz, to make an experimental voyage, and it possible, to cross the Channel, and descend on the continent. Mr. Green had for some time resolved to endeavor to accomplish this object, but the time when the experiment should be made, if it were fixed at all, was kept quite secret.—On Monday morning the weather proving favorable, and the wind blowing in the direction desired, it was determined that the ascent should take place that day. Accordingly at seven o'clock in the morning the inflation of the balloon commenced, and by about one o'clock all was ready for the aeronauts to proceed on their voyage. At twenty-six minutes past one, three gentlemen, Messrs. Green, Mason and Holland, entered the car, and the balloon directly ascended. Very few persons were about the gardens, in consequence of the proceedings not having been made public.—The appearance of the balloon as it rose, was finer, we think, than on any previous occasion; it appeared quite full of gas, and the colors of the silk were seen to great advantage. Above a ton of ballast was placed in the car, and the balloon may therefore continue up a very long time, by relieving it gradually of its weight. It was not intended however, to continue any great length of time in the atmosphere, although the voyagers provided themselves with everything it was thought probable they might require during the time they continued there, such as ham, fowls, brandy &c., also some cold coffee, to warm which, they took with them a quantity of unslacked lime. In order to provide against accidents, in case they could descend while night continued they had a number of blue-lights with them which they could ignite, and throw out of the car, and by the light thus obtained, learn the nature of the country the balloon was passing over. Mr. Green and his friends were provided with passports, and a letter to the King of Belgium from the Embassy in London. It was expected that the balloon would most likely reach the French Coast by about six or seven o'clock; but this is entirely a matter of conjecture, as it is impossible to say what currents of air it might meet with which would either facilitate or retard its progress. Since the above was written the Mayor of Dover has addressed a letter to the proprietors of Vauxhall Gardens, enclosing one from Mr. Green, which was thrown out of the balloon into Dover, about 5 o'clock on Monday afternoon. The balloon was the proceeding in a S. E. direction, and at dusk hung out a light from the bottom of the car. The *Morning Chronicle* of Thursday states, that the aeronauts descended at St. Omers, France, at seven o'clock on *Monday* evening.

LENSES.

It is to the refraction of light that we are indebted for the use of lenses or artificial glasses to aid the powers of vision. It lays the foundation of telescopes, microscopes, camera obscuras, phantasmagorias, and other optical instruments, by which so many beautiful, useful, and wonderful effects have been produced. In order, therefore, to illustrate the principles on which such instruments are constructed, it is necessary to explain the manner in which the rays of light are refracted and modified when passing through spherical mediums of different forms.

A lens is a transparent substance of a different density from the surrounding medium, and terminating in two surfaces, either both spherical, or one sperical and the other plain. It is usually made of *glass*, but is also formed of any other transparent substance, as ice, crystal, diamond, pebbles, or by fluids of different densities and refractive powers, enclosed between concave glasses. Lenses are ground into various forms, according to the purpose they are intended to serve. They may be generally distinguished as being either *convex* or *concave*. A convex glass is thickest in the middle, and thinner toward the extremities.—Of these there are various forms, which are represented in the cut. A is a plano-convex lens, which has one side plane, and the other spherical or convex. B is a plano-concave, which is plane on the one side, and concave on the other. C is a double-convex, or one which is sphericrl on both sides. D a double-concave, or concave on both sides. E is called a meniscus, which is convex on one side and concave on the other. F is a concavo-convex, the convex side of which is of a smaller sphere than the concave. In regard to the degree of convexity or concavity in lenses, it is evident that there may be almost an infinite variety.—For every convex surface is to be considered as the segment of a circle, the diameter and radius of which may vary to almost any extent. Hence lenses have been formed by opticians, varying from one fiftieth of an inch in radius to two hundred feet. When we speak of the length of the radius of a lens, as, for instance, when we say that a lens is two inches or forty inches radius, we mean that the convex surface of the glass is the part of a circle, the radius of which, or half the diameter, is two inches, or forty inches; or, in other words, were the portion of the sphere on which it is ground formed into a globe of corresponding convexity, it would be four inches or eighty inches in diameter.

To mend Iron Pots.

To repair cracks, &c. in pots and pans, mix some finely sifted lime with well beaten whites of eggs, till reduced to a paste; then add some iron file dust, apply the composition to the injured part, and it will soon become hard and fit for use.

Oranges, figs, bananas, grapes, citrons, pears, peaches, and a variety of other delightful fruits, abound in Monterey.

Making Mouths.

A London Gazette suggests that when a lady would compose her mouth to a bland and serene character she should just before entering the room say *besom*, and keep the expression into which the mouth subsides until the desired effect upon the company is evident.—If on the other hand she wishes to assume a distinguished and somewhat noble bearing not suggestive of sweetness, she should say *brush*, the result of which is infallible. If she would make her mouth look small and pretty she should say *flip*, but if the mouth be already too small and needs enlarging she must say *cabbage*. Perhaps a due attention to these rules might be useful to all persons intending to submit to the modern process of Daguerreotype portraiture.

To Polish Varnished Furniture.

Take two ounces of tripoli powdered, put it in an earthen pot with water to cover it; then take a piece of white flannel, lay it over a piece of cork or rubber, and proceed to polish the varnish, always wetting it with the tripoli water. It will be known when the process is finished by wiping a part of the work with a sponge, and observing whether there is a fair, even gloss.

Yankee Ingenuity in England.

Mackintosh, the celebrated India rubber manufacturer, took the contract to raise the steamer Great Britain, after the most skilful English Engineers had abandoned the work. Mackintosh was born and educated in America.

Bait for Rats.

Mix a paste of corn meal with raw eggs, which is the best bait for a wire trap; they will all get in if there is room.

THE NEW YORK
SCIENTIFIC AMERICAN:
Published Weekly at 128 *Fulton Street.*, (*Sun Building,*) *New York.*

BY MUNN & COMPANY.

The SCIENTIFIC AMERICAN is the Advocate of Industry and Journal of Mechanical and other Improvements: as such its contents are probably more varied and interesting, than those of any other weekly newspaper in the United States, and certainly more useful. It contains as much interesting Intelligence as six ordinary daily papers, while for *real benefit*, it is unequalled by any thing yet published Each number regularly contains from THREE to SIX ORIGINAL ENGRAVINGS, illustrated by NEW INVENTIONS, American and Foreign,—SCIENTIFIC PRINCIPLES and CURIOSITIES,—Notices of the progress of Mechanical and other Scientific Improvements, Scientific Essays on the principles of the Sciences of MECHANICS, CHEMISTRY and ARCHITECTURE,—Catalogues of American Patents,—INSTRUCTION in various ARTS and TRADES, *with engravings*,—Curious Philosophical Experiments,—the latest RAIL ROAD INTELLIGENCE in EUROPE and AMERICA,—Valuable information on the Art of GARDENING, &c. &c.

This paper is especially entitled to the patronage of MECHANICS and MANUFACTURERS, being devoted to the interests of those classes. It is particularly useful to FARMERS, as it will not only apprise them of IMPROVEMENTS in AGRICULTURAL IMPLEMENTS, but INSTRUCT them in various MECHANICAL TRADES, and guard against impositions. As a FAMILY NEWSPAPER, it will convey more USEFUL Intelligence to children and young people, than five times its cost in school instruction.

Being published in QUARTO FORM, it is conveniently adapted to PRESERVATION and BINDING.

TERMS.—The Scientific American is sent to subscribers in the country at the rate of $2 a year, ONE DOLLAR IN ADVANCE, the remainder in 6 months. Persons desiring to subscribe, have only to enclose the amount in a letter, directed to

MUNN & COMPANY,
Publishers of the Scientific American, New York.

☞ Specimen copies sent when desired. All letters must be POST PAID.